

**RULE 239 GRAPHIC ARTS OPERATIONS**

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## 100 GENERAL

**101 PURPOSE:** To limit the emissions of volatile organic compounds from graphic arts operations.

### 102 APPLICABILITY:

102.1 Geographic: The provisions of this rule apply ~~only to facilities located in the Sacramento Valley Air Basin portion of Placer County, as defined by California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 1.5, Article 1, Section 60106~~ all graphic arts operations located in Placer County.

102.2 Operations: Except for the operations listed in Section ~~403104~~, EXEMPTIONS, the provisions of this rule apply to all GRAPHIC ARTS OPERATIONS as defined in Section ~~24319~~ and to any person who manufactures, sells, offers to sell, or supplies any graphic arts materials listed in Sections 301, 302, ~~3034~~ and 305, STANDARDS. (GRAPHIC ARTS OPERATIONS are typically categorized under the Standard Industrial Classification (SIC) Codes of 27xx).

**103 SEVERABILITY:** If a court of competent jurisdiction issues an order that any provision of this rule is invalid, it is the intent of the Board of Directors of the District that other provisions of this rule remain in full force and effect, to the extent allowed by law.

### **1034 EXEMPTIONS:**

#### **104.1 GENERAL**

104.1.1 Until (six months after the date of adoption of the amendments to this rule), the requirements of this rule, with the exception of Sections 302 and 501.1-3, shall not apply to any graphic arts operation at a stationary source which emits less than 660 pounds of volatile organic compounds per calendar month from all graphic arts operations, including cleaning materials, and excluding operations addressed in Section 104.2.

104.1.2 After (six months after the date of adoption of the amendments to this rule), the requirements of this rule, with the exception of Sections 302 and 501.1-3, shall not apply to any graphic arts operation at a stationary source which either:

104.1.2.1. has actual emissions of less than or equal to 60 pounds per calendar month of volatile organic compounds from all graphic arts operations and cleaning materials; or

104.1.2.2. receives a permit that limits the potential to emit, as calculated pursuant to Rule 502, NEW SOURCE REVIEW, to less than or equal to 175 pounds of volatile organic compounds per calendar month from all graphic arts operations and cleaning materials.

~~1034.1 Exemption, Partial, Low Emission Limit: Any graphic arts facility which emits less than 660 pounds of volatile organic compounds per calendar month from all graphic arts operations, including surface preparation and cleanup solvents, is exempt from all provisions of this rule with the exception of Section 501, USAGE RECORDS. Records required by Section 501, shall be maintained by these facilities to demonstrate their exemption status.~~

~~1034.2~~ Exemption, Partial: Proof Presses and/or Research and Test Development Operations: Until (six months after the date of adoption of the amendments to this rule), this rule, with the exception of Sections 302 and 501.1-3, shall not apply to any ~~G~~graphic arts operations used exclusively for research, laboratory analysis or determination of product quality and commercial acceptance, such as proof presses or other proofing systems, provided that total VOC emissions from all such equipment do not exceed 300 pounds per calendar month per facility stationary source.~~, are exempt from all provisions of this rule, with the exception of Section 501, USAGE RECORDS. Records required by Section 501, shall be maintained by these facilities to demonstrate their exemption status. As noted above, this exemption shall expire six months after the date of adoption of the amendments to this rule.~~

~~103.3~~ Exemption, Screen Printing: Screen printing operations are exempt from all provisions of this rule.

~~1034.43~~ Exemption From Rule 219: The provisions of Rule 219, Organic Solvents, shall not apply to Graphic Arts Operations as defined in Rule 239, Section 2~~43~~19.

104.4 Gravure Printing Operations: This rule shall not apply to gravure printing operations.

104.5 Business and Personal Printers: This rule shall not apply to business and personal printers such as ink jets, bubble jets, and laser jets.

104.6 Prepress Operations: This rule shall not apply to prepress operations associated with printing plate making including film photo processors and plate photo processors.

104.7 Aerosol Adhesives – Screen Printing: The requirements in Section 302 of this rule shall not apply to aerosol adhesives used by screen printing operations provided that the aerosol adhesives comply with the VOC limits for aerosol adhesives under Section 300 - STANDARDS in Rule 235 – ADHESIVES.

104.8 Aerosol Adhesives – Graphic Arts Operations: The requirements of this rule shall not apply to aerosol adhesives used by graphic arts operations provided that the VOC emissions from the facility are less than 660 pounds per month from all graphic arts operations.

## 200 DEFINITIONS

~~201~~ CAPTURE EFFICIENCY: Expressed in percent, capture efficiency is the ratio of the weight of the VOC in the effluent stream entering a control device to the weight of the VOC emitted from graphic arts operations, both measured simultaneously in accordance with Section 502.5, and calculated by the following equation:

$$\text{Capture Efficiency} = \frac{W_e}{W_e} \times 100$$

Where:  $W_e$  = Weight of VOC entering the control device

$W_e$  = Weight of VOC discharged from the coating operations

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- 201** **ADHESIVE:** Any substance used to bond one surface to another surface by attachment.
- 202** **AEROSOL ADHESIVE:** An adhesive consisting of a mixture of rubber, resins, liquid and /or gaseous solvents, and propellants packaged in a hand-held, pressurized, non-refillable container. The container expels the pressurized aerosol materials in a finely divided spray when a valve on the container is depressed.
- 203** **APPLICATION EQUIPMENT:** A device used to apply adhesive, coating, or ink materials.
- 204** **BLANKET AND ROLLER WASHES:** Cleaning materials, which are used to remove the printing inks, oils, and paper pieces from the blankets and rollers excluding metering rollers and plates.
- 205** **CLOSED CONTAINER:** A container which has a cover that meets with the main body of the container without any visible gaps between the cover and the main body of the container.
- 2026** **COATING:** ~~A The application of a uniform~~ layer of material, excluding adhesives, applied across the entire width of a substrate. ~~These machines which have both coating and printing units are considered to be performing a graphic arts operation. For~~ Examples in printing, are an emulsion, varnish or lacquer applied over a printed surface, and, in platemaking, the light-sensitive polymer or mixture applied to a metal plate.
- 207** **COLD BENDING:** A process which subjects the printed color, design, alphabet, symbol, or numeral on a printed object to permanent bending through the application of force.
- 2038** **CONTROL DEVICE:** Equipment such as an incinerator or adsorber used to prevent air pollutants from reaching the ambient air.
- ~~**204** **CONTROL DEVICE EFFICIENCY:** Expressed in percent, control device efficiency is the ratio of the weight of the VOC removed by the control device from the effluent stream entering the control device to the weight of VOC in the effluent stream entering the control device, both measured simultaneously in accordance with Section 502.4, and calculated by the following equation:~~
- $$\text{Control Device Efficiency} = \frac{(W_e - W_a)}{W_e} \times 100$$
- ~~Where:~~
- ~~$W_e$  = Weight of VOC entering the control device~~
- ~~$W_a$  = Weight of VOC discharged from the control device~~
- 20509** **CONVERTING OPERATION:** Coating, waxing, laminating, extrusion coating and printing, for fabrication of base materials. The base materials are then used to produce wraps, bags, and other preformed packages.
- ~~**206** **DOCTOR BLADE:** A steel blade used to scrape excess ink from a printing plate.~~
- 20710** **DRYING OVEN:** An oven used to hasten the process of drying printed or coated material.

- 211** **ELECTRONIC CIRCUIT:** A product which consists of a substrate and circuitry, created by screen printing a conductive ink on the substrate.
- 212** **EMBOSSING:** A process performed after printing to stamp a raised or depressed image (artwork or type) into the surface of the paper, using engraved metal embossing dies, extreme pressure and heat.
- 20813** **EXEMPT COMPOUNDS:** For the purposes of this rule, Exempt Compounds are as defined in Rule 102, Definitions.
- 214** **EXTREME PERFORMANCE INK/COATING:** An ink or coating, used in screen printing on a non-porous substrate, that is designed to resist or withstand any of the following:
- 214.1 five or more years of outdoor exposure;
- 214.2 exposure to industrial-grade chemicals, solvents, acids, detergents, oil products (including fuels), cosmetics, temperatures exceeding 76 °C (170 °F), vacuum forming, embossing or molding.
- 20915** **FLEXIBLE PACKAGING INDUSTRY:** Establishments that convert materials consisting of light gauge papers, plastic films, cellulosic films such as cellophane, thin gauge metal sheets such as aluminum foil or steel foil, and combinations thereof into a variety of product packages.
- 21016** **FLEXOGRAPHIC PRINTING:** A printing operation utilizing a flexible rubber or other elastomeric plate in which words, designs, or pictures are applied to a substrate by means of a roll printing technique in which a the image area is raised relative to the nonimage area pattern is applied to an image carrier made of rubber or other electrometric materials mounted on a steel matting cylinder. The image is then printed directly from the raised pattern to the substrate.
- 21417** **FOUNTAIN SOLUTION:** The solution applied to the image plate to maintain the hydrophilic properties of the nonimage areas and to keep the nonimage area free from ink. Fountain solution is primarily water, and contains at least one of the following materials:
- 217.1 etchants such as mineral salts
- 217.2 hydrophilic gums
- 217.3 VOC additives to reduce the surface tension of the solution.
- 21218** **FUGITIVE EMISSIONS:** Emissions of VOC from any portion of Graphic Arts Operations as defined in Section 2139, other than the drying oven.
- 21319** **GRAPHIC ARTS OPERATIONS:** Any Publication gravure, ~~packaging gravure, web-feed wallpaper~~ screen printing, ~~specialty gravure, flexographic printing operations,~~ lithographic ~~printing operations,~~ or letterpress printing operations, or any coating or laminating operation that manufactures flexible packaging material for the packaging industry. Processing Equipment which has both coating and printing units is considered to be performing a graphic arts operation. Coating operations, which are performed by a machine having only coating units and no printing units, are not graphic arts operations except for flexographic printing operations.
- 21420** **GRAVURE PRINTING:** ~~An intaglio printing operation using a plate in which the image area is etched or engraved onto the surface. the ink is transferred from minute image area is etched wells which comprise the image on a plate to the substrate which is supported by an impression roller, with excess ink removed from the plate by a doctor~~

~~blade below the surface of the printing plate and is transferred directly to the substrate when the substrate is pressed against the plate by an impression roller.~~

~~215~~ **INTAGLIO PRINTING:** ~~A printing operation done from a plate in which the image is etched or engraved into the surface.~~

221 **HEAT BENDING:** A process, which subjects the printed color, design, alphabet, symbol, or numeral on a printed object to permanent bending through the application of heat and force.

222 **HEATSET INK:** A printing ink used on continuous web-feed printing presses that are equipped with dryers or ovens. The ink dries or sets by heat induced evaporation of the ink oils and subsequent chilling of the ink by chill rolls.

223 **INFLATING:** A process of filling a printed object with air or gas which results in the swelling of the printed area.

~~216~~24 **LAMINATING OPERATIONS:** A process of composing two or more layers of material to form a single multiple-layer sheet by using adhesive as the bonding agent.

~~217~~25 **LETTERPRESS PRINTING:** A printing operation in which the image area is raised relative to the non-image area and the ink is transferred to the paper directly from the image surface.

~~218~~26 **LINE:** The minimum equipment which is required for the application and/or curing of inks and/or coatings on a substrate, including the ink and/or coating applicators and heating oven(s) and associated ink and coating mixing equipment.

~~219~~27 **LITHOGRAPHIC PRINTING:** A printing operation in which the image and non-image areas exist in the same plane. The non-image area is treated chemically so that only the image areas will be printed onto the substrate.

228 **LITHOGRAPHIC AND LETTER PRESS PRINTING, OTHER CLEANING:** Cleaning of metering rollers and printing plates.

229 **MAINTENANCE CLEANING:** A solvent cleaning operation or activity carried out to keep tools, machinery, or general work areas in clean and good operational condition.

230 **MATERIAL:** Any material containing VOC including but not limited to coating, adhesive, inks (e.g., printing ink, metallic ink, ultraviolet ink), fountain solutions, thinners, reducers, catalysts, colorants, or solvents used in cleaning.

231 **MECHANICALLY FORMED PRODUCTS:** Screen printed products made of plastic substrates which are subjected to vacuum-forming, embossing, inflating, heat bending, or cold bending processes after the screen printing operation.

232 **METALLIC INK:** An ink that contains greater than 50 grams of metal per liter (0.4 lb/gal) of ink.

233 **METERING ROLLER:** A roller to transfer and meter water to maintain hydrophilic properties.

234 **NONCOMPLIANT MATERIAL:** A material that:

234.1 exceeds the VOC content limits specified in Section 302, and is not exempt pursuant to Section 104, and does not use emission control equipment pursuant to Section 303; or

234.2 exceeds the VOC content limit and/or composite vapor pressure limit, as applicable, in Section 302, and does not use emission control equipment pursuant to Section 303.

**22035 NON-HEATSET INK:** An ink ~~which that sets and dries primarily~~ by absorption into the substrates, and hardens by ambient air oxidation that may be accelerated by the use of infrared light sources. For purposes of this definition ultraviolet and electron-beam curable inks are examples of non-heatset inks ~~and absorption into the substrate without the use of heat from dryers or ovens, used primarily in lithographic and letterpress printing.~~

**22436 NON-POROUS SUBSTRATE:** Any substrate whose surface prevents penetration by water, including other than paper, or paperboard, but is not limited to foil, polyethylene, polypropylene, cellophane, paper or paperboard coated with a non-porous surface, material, metallized polyester, nylon and polyethylene terephthalate (mylar). ~~but not including wood, metal, or ceramic materials.~~ Clay-coated printing paper as defined by the American Paper Institute Classification System, and paperboard coated with clay to prevent water penetration shall be considered non-porous substrates.

**22237 OFFSET PRINTING:** A lithographic printing operation in which the image area is transferred, or offset, to another surface, and then printed onto the substrate.

**238 OVERLAY:** A screen printed product made of polycarbonate, polyester, or clear vinyl plastic substrate which activates the circuitry on an electronic circuit underneath it when pressed against the electronic circuit. Overlays and electronic circuits are used in membrane switches of products such as computer keyboards, calculators, control panels, and home appliances.

~~**223 PACKAGING GRAVURE PRINTING:** A gravure printing operation on paper, paperboard, foil, film or other substrates which are to be used to produce containers or packages.~~

~~**224 POROUS SUBSTRATE:** Paper, or paperboard.~~

**239 PREPRESS OPERATIONS:** Operations associated with printing plate making using film photo processors and plate photo processors.

**240 PRINTING:** Any graphic arts operation that imparts color, design, alphabet, or numerals on a substrate.

**241 PRINTING INK:** A pigmented fluid or viscous material used in printing.

**242 PROOF PRESS:** A press used exclusively to check the quality of print, color reproduction, and editorial content.

~~**225 PRODUCTION UNIT:** A ream of paper, consisting of 500 sheets of paper.~~

~~**226 PUBLICATION GRAVURE PRINTING:** A gravure printing operation on paper which is subsequently formed into books, magazines, catalogs, brochures, directories, newspaper supplements or other publication material.~~

- 243**     **REFRIGERATED CHILLER:**    A device that continuously maintains and supplies fountain solution to a holding tray at a temperature of 55 degrees Fahrenheit or less when measured at the supply tank, thereby reducing evaporative emissions of VOCs in fountain solution.
- 244**     **REPAIR CLEANING:**    Cleaning of equipment parts as part of a repair operation or as part of a scheduled maintenance procedure during which the parts are not removed from the equipment and power to the printing equipment has been turned off and secured.
- 22745**   **SCREEN PRINTING:**    A printing operation in which the printing ink passes through a refined form of stencil to a web or fabric. The stencil openings determine the form and dimension of the imprint.
- 246**     **SIGN INK/COATING:**    A printing ink or coating used in screen printing indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.
- 247**     **SOLVENT CLEANING:**    The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants including, but not limited to, dirt, soil, and grease from equipment, substrate, and general work areas.
- 248**     **SPECIALTY FLEXOGRAPHIC PRINTING:**    Flexographic printing on polyethylene, polyester and foil substrates for food packaging, health care products, fertilizer bags, or liquid-tight containers.
- 228**     **SPECIALTY GRAVURE PRINTING:**    ~~A gravure printing operation for production of wall and floor covering, decorated household paper products such as towels and tissues, cigarette filter tips, vinyl upholstery, gift wrap, and woodgrains.~~
- 22949**   **STANDARD INDUSTRIAL CLASSIFICATION (SIC):**    Number codes created by the U. S. Government Office of Management and Budget (OMB) to classify establishments by type of economic activity.
- 250**     **STATIONARY SOURCE:**    Any building, structure, facility, or emissions unit which emits or may emit any affected pollutant directly or as a fugitive emission.
- 250.1**    Building, structure, facility, or emissions unit includes all pollutant emitting activities which:
- 250.1.1**        Belong to the same industrial grouping, and
- 250.1.2**        Are located on one property, or two or more contiguous properties, and
- 250.1.3**        Are under the same or common ownership, operation, or control, or which are owned or operated by entities which are under common control.
- 250.2**    Pollutant emitting activities shall be considered as part of the same industrial grouping if:
- 250.2.1**    They belong to the same two-digit Standard Industrial Classification (SIC) code, or
- 250.2.2**    They are part of a common production process, which includes industrial processes, manufacturing processes and any connected processes involving a common material.
- 251**     **SUBSTRATE:**    The surface to which a printed image is applied. Substrates include, but are not limited to, paper, plastic, metal, wood, ceramic, and fabric.

**252** **ULTRAVIOLET INK:** Ink which dries by polymerization reaction induced by ultraviolet energy.

**253** **VACUUM-FORMING:** A process which imparts a desired shape to a printed object by subjecting the screen printed area of the object to a vacuum.

**254** **VOC COMPOSITE PARTIAL PRESSURE:** The sum of the partial pressures of the compounds defined as VOCs. VOC composite partial pressure is calculated pursuant to Section 403.

**23055** **VOLATILE ORGANIC COMPOUNDS (VOC):** Any chemical compound containing at least one atom of carbon except for the Exempt Compounds listed in Rule 102, Definitions.

**256** **VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED:** A VOC as applied means the VOC content of the material as applied including thinners, reducers, hardeners, retarders, catalysts and additives calculated pursuant to Section 502.1.

**257** **VOLATILE ORGANIC COMPOUND (VOC) AS SUPPLIED:** A VOC as supplied means the VOC content of the original material as supplied by the manufacturer calculated pursuant to Section 502.1.

**258** **WATER SLIDE DECALS:** Decals which are screen printed onto treated paper stock, and are removable from the stock by the dissolution of an underlying, water-soluble adhesive or a similar carrier.

~~**231** **VOC CONTENT OF FOUNTAIN SOLUTIONS, MAKEUP SOLVENTS, SURFACE PREPARATION SOLVENTS AND CLEANUP SOLVENTS:** The weight of VOC per volume of material. It shall be determined using the appropriate test method pursuant to Section 502 and calculated by the following equation:~~

$$\text{Grams of VOC per Liter of Material} = \frac{W_m - W_w - W_{ec}}{V_m}$$

Where:

~~$W_m$  = Weight of all volatile compounds in grams  
 $W_w$  = Weight of water in grams  
 $W_{ec}$  = Weight of exempt compounds in grams  
 $V_m$  = Volume of material in liters~~

~~**232** **VOC CONTENT OF INKS, COATINGS AND ADHESIVES:** The weight of VOC per liter of material, less water and exempt compounds. It shall be determined using the appropriate test method pursuant to Section 502, and calculated by the following equation:~~

$$\text{Grams per Liter less Water and Exempt Compounds} = \frac{W_m - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where:

~~$W_s$  = Weight of volatile compounds in grams.  
 $W_w$  = Weight of water in grams.~~

~~$W_{es}$  = Weight of exempt compounds in grams.~~  
 ~~$V_m$  = Volume of material in liters.~~  
 ~~$V_w$  = Volume of water in liters.~~  
 ~~$V_{es}$  = Volume of exempt compounds (as defined in Rule 102, Definitions), in liters.~~

**23359 WEB:** A continuous sheet of substrate that is printed on web-fed printing presses.

**23460 WEB-FEED:** An automatic system on a printing press which supplies a web substrate for printing from a continuous roll or web or from an extrusion conversion process ~~to the printing unit.~~

**261 WIPE CLEANING:** The method of cleaning a surface by physically rubbing the surface with a material such as a rag, paper, or a sponge moistened with a solvent.

### 300 STANDARDS

**301 GENERAL REQUIREMENTS:** Any person operating equipment for GRAPHIC ARTS OPERATIONS as defined in Section 2139, ~~and any related coating, laminating or converting operations on porous or nonporous substrates,~~ shall comply with one of the following requirements:

301.1 Use only low-VOC (Volatile Organic Compounds) inks, coatings, adhesives, and fountain solutions as specified in Section 302 ~~and 303~~, of this rule; or

301.2 Install and operate on the line, an approved emission control system pursuant to Section 3043, with a control device efficiency of at least 95 percent on a mass basis, ~~calculated in accordance with Section 204,~~ and a capture collection efficiency of at least 70% on a mass basis. ~~, calculated in accordance with Section 204.~~ (Note that the use of an approved emission control system does not eliminate the need to comply with the provisions of Section 3054 of this rule.)

**302 ~~LOW-VOC INK, COATING AND ADHESIVE REQUIREMENT~~ VOC CONTENT LIMITS FOR MATERIALS USED IN GRAPHIC ARTS OPERATIONS:** Except for graphic arts operations exempt pursuant to Section 104, no person shall apply any material with a VOC content in excess of the limits specified below. The VOC content of the material as applied shall be determined pursuant to Section 502.1. Any person choosing to comply with this rule through the use of low-VOC inks, coatings, adhesives, or fountain solutions or makeup solvents, shall comply with the following requirement:

~~302.1 Use only inks, coatings, or adhesives, which contain, on an as-applied basis, 300 grams or less of VOC per liter (2.5 pounds per gallon) of material, less water and exempt compounds, calculated as defined in Section 232.~~

302.1 VOC Content for Inks, Coatings, and Adhesives:

<u>MATERIAL TYPE</u>	<u>VOC CONTENT gm/l (lb/gal)</u> <u>Less water and exempt compounds</u>		
	<u>Effective</u> <u>8/14/97</u>	<u>Effective</u> <u>Date</u> <u>(Six months</u> <u>after the</u> <u>date of</u> <u>adoption of</u> <u>the</u> <u>amendment</u> <u>to this rule)</u>	<u>Effective</u> <u>Date</u> <u>(Twelve</u> <u>months</u> <u>after the</u> <u>date of</u> <u>adoption of</u> <u>the</u> <u>amendment</u> <u>to this rule)</u>
<u>General</u> Printing Ink Adhesive Coating	<u>300 (2.5)</u> <u>300 (2.5)</u> <u>300 (2.5)</u>	<u>300 (2.5)</u> <u>150 (1.25)</u> <u>300 (2.5)</u>	<u>300 (2.5)</u> <u>150 (1.25)</u> <u>300 (2.5)</u>
<u>Screen Printing</u> Printing Ink Adhesive Coating Electronic Circuit Extreme Performance Ink/Coating Metallic Ink Sign Ink/Coating Mechanically Formed Products Overlays Web-Fed Wallpaper Water Slide Decals	- - - - - - - - - - - -	- - - - - - - - - - - -	<u>400 (3.3)</u> <u>150 (1.25)</u> <u>400 (3.3)</u> <u>800 (6.7)</u> <u>800 (6.7)</u> <u>400 (3.3)</u> <u>500 (4.1)</u> <u>800 (6.7)</u> <u>800 (6.7)</u> <u>300 (2.5)</u> <u>800 (6.7)</u>

302.2 VOC Content for Fountain Solution Materials:

<u>MATERIAL TYPE</u>	<u>VOC CONTENT</u> <u>gm/l (lb/gal)</u> <u>Including water and exempt</u> <u>compounds</u>	
	<u>Effective</u> <u>8/14/97</u>	<u>Effective Date</u> <u>(Six months after</u> <u>the date of</u> <u>adoption of the</u> <u>amendments to</u> <u>this rule)</u>
<u>Fountain Solutions – Chilled Using</u> <u>Refrigerated Chiller</u>	<u>116(0.97)</u>	<u>100 (0.83)</u>
<u>Fountain Solutions – Non-Chilled</u>	<u>116(0.97)</u>	<u>80 (0.67)</u>

302.3 Temperature Gauge Requirements Refrigerated Chiller: The refrigerated chiller shall be equipped with a temperature gauge. The temperature of the fountain solution shall be maintained at 55 °F or less.

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~~303 LOW-VOC FOUNTAIN SOLUTION AND MAKEUP SOLVENT REQUIREMENT:~~ Any person choosing to comply with this rule through the use of low-VOC fountain solutions and makeup solvents, shall comply with the following requirement:

~~303.1 Use only fountain solutions and makeup solvents which contain, on an as-applied basis, 116 grams or less of VOC per liter (0.97 pounds per gallon) of material, calculated as defined in Section 231.~~

**3043 APPROVED EMISSION CONTROL SYSTEM EQUIPMENT:** A system for reducing emissions of volatile organic compounds, approved by the Air Pollution Control Officer, and which satisfies both of the following conditions:

~~303.1 It includes a capture system which collects all drying oven exhaust and fugitive emissions from the line and transports them to the control device, and~~

~~303.2 It includes a control device designed and operated to achieve the efficiencies specified in Section 301.2, at all times during normal operation of the line being controlled. As an alternative to Sections 301 and 304.12, a person may use air pollution control equipment providing it satisfies the following:~~

303.1 The air pollution control equipment is approved by the Air Pollution Control Officer pursuant to Rule 501, GENERAL PERMIT REQUIREMENTS, and

303.2 The air pollution control equipment is designed and operated with:

303.2.1 A control device efficiency of at least 95 percent on a mass basis, as determined pursuant to Sections 406 and 502.4, and

303.2.2 An emission collection efficiency of at least 70 percent on a mass basis, as determined pursuant to Section 502.5.

**3054 SURFACE PREPARATION AND CLEANUP REQUIREMENTS CLEANING AND STORAGE REQUIREMENTS:** Any person using surface preparation and cleanup solvents for graphic arts operations shall comply with the following requirements:

~~305.1 Use only surface preparation solvents and cleanup solvents which contain, on an as-applied basis, 116 grams or less of VOC per liter (0.97 pounds per gallon) of material, calculated as defined in Section 231.~~

~~305.2 Place all VOC-contaminated cloth, paper or other materials used for surface preparation and cleanup only in closed containers for storage or disposal.~~

~~305.3 Place and store all fresh or spent VOC-containing materials only in closed containers.~~

304.1 Materials used for solvent cleaning shall not exceed the VOC and/or composite vapor pressure limits specified in the table below. The VOC content of the material as applied shall be determined pursuant to Section 502.1. The composite partial pressure shall be determined using Section 502.6.

<u>Material Type</u>	<u>VOC Content gm/l (lb/gal) Including Water and Exempt Compounds</u>		<u>VOC Composite Partial Pressure Millimeters of Mercury at 20 °C (68 °F)</u>
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<u>Material Type</u>	<u>VOC Content gm/l (lb/gal) Including Water and Exempt Compounds</u>		<u>VOC Composite Partial Pressure Millimeters of Mercury at 20 °C (68 °F)</u>
<u>General (e.g., maintenance, repair, solvent, wipe) Cleaning</u>	<u>72 (0.60)</u>		
<u>Application Equipment Cleaning</u>			
1. <u>General (not specifically listed below)</u>	<u>100 (0.83)</u>	<u>AND</u>	<u>3</u>
2. <u>Lithographic and Letter Press Printing, Blanket and Roller Washes</u>	<u>300 (2.5)</u>	<u>OR</u>	<u>10</u>
3. <u>Lithographic and Letter Press Printing, Other Cleaning</u>	<u>300 (2.5)</u>	<u>OR</u>	<u>25</u>
4. <u>Screen Printing</u>	<u>300 (2.5)</u>	<u>OR</u>	<u>10</u>
5. <u>Flexographic Printing</u>	<u>100 (0.83)</u>	<u>AND</u>	<u>3</u>
6. <u>Specialty Flexographic Printing</u>	<u>810 (6.8)</u>	<u>AND</u>	<u>21</u>
7. <u>Ultraviolet Inks (Except Screen Printing)</u>	<u>800 (6.7)</u>	<u>AND</u>	<u>33</u>

304.2 **Lithographic and Letter Press Printing, Other Cleaning:** The total usage for this cleaning category shall not exceed 15 percent (by volume) of the total monthly usage of the Lithographic and Letter Press Printing, Blanket and Roller Washes category. The percentage of the solvents used for Lithographic and Letter Press Printing, Other Cleaning shall be calculated as follows:

$$\% \text{ Usage} = \frac{G}{Y} * 100\%$$

Where: G = Total usage for Lithographic and Letter Press Printing, Other Cleaning materials (gal/month)  
Y = Total material usage for Lithographic and Letter Press Printing, Blanket and Roller Washes (gal/month)

304.3 Closed containers shall be used for the disposal of all VOC-containing cloth, sponges, papers, or other materials used for solvent cleaning.

304.4 All VOC-materials shall be stored in closed containers when not in use.

**305 PROHIBITION OF SALE:** A person shall not supply, sell, solicit, or offer for sale, any noncompliant material as defined in Section 234 for use in graphic arts operations. The prohibition in this section shall apply to any graphic arts material which will be applied at any physical location within the District.

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## 400 ADMINISTRATIVE REQUIREMENTS

**401 OPERATION AND MAINTENANCE PLAN:** Any person using ~~an~~ existing emission control ~~system~~ equipment pursuant to Section 304~~3~~, as a means of complying ~~compliance~~ with this rule, as provided in Section 301 and 302, must ~~shall~~ submit, an Operation and Maintenance Plan for the emission control ~~system~~ equipment to the Air Pollution Control Officer for approval. A person proposing to install ~~a~~ new emission control ~~system~~ equipment as a means of ~~compliance~~ complying with this rule shall submit in addition to an Operation and Maintenance Plan, an application for an Authority to Construct, pursuant to Rule 501, General Permit Requirements. The Plan shall specify key system operating parameters such as temperatures, pressures, and/or flow rates, as necessary to determine compliance with this rule and shall describe detailed procedures to maintain the approved emission control equipment, and maintenance procedures, which will demonstrate continuous operation of the emission control system during periods of emissions-producing operations. The Plan shall also specify which records must be kept to document these operating and maintenance procedures. These records shall comply with the requirements of Sections 501.4, and 501.5. The Plan shall be implemented upon approval of the Air Pollution Control Officer.

~~**402 COMPLIANCE STATEMENT REQUIREMENT:** The manufacturer or distributor of all inks, coatings, adhesives, fountain solutions, makeup solvents, and surface preparation and cleanup solvents which are sold for use in graphic arts operations within the District shall include on product data sheets a designation of both the as-supplied VOC content (prior to any recommended dilution) and the as-applied VOC content (based on any recommended dilution) of each material. The VOC content of inks, coatings, and adhesives shall be given pursuant to Section 302.1. The VOC content of fountain solutions and makeup solvents, shall be given pursuant to Section 303.1. The VOC content of surface preparation and cleanup solvents shall be given pursuant to Section 305.1.~~

**402 PRODUCT INFORMATION REQUIREMENTS FOR SELLERS:** Any person who sells any material subject to this rule shall make available to the purchaser at the time of sale the following information:

402.1 The material type by name/code/manufacturer;

402.2 For materials subject to Section 302.1: The maximum VOC content of the material (adhesive, ink and coating), as supplied. The VOC content shall be displayed as grams of VOC per liter of material (or pounds of VOC per gallon), excluding water and exempt compounds;

402.3 For materials subject to Section 302.2: The maximum VOC content of the fountain solution, as supplied. The VOC content shall be displayed as grams per liter of material (or pounds of VOC per gallon), including water and exempt compounds as determined pursuant to Section 502.1;

402.4 For materials subject to Section 304.1: The maximum VOC content and the total VOC composite partial pressure of the material as supplied. The VOC content shall be displayed as grams of VOC per liter of material (or pounds of VOC per gallon), including water and exempt compounds as determined pursuant to Section 502.1. The composite vapor pressure shall be displayed in millimeters of mercury at 20 °C (68 °F) as determined pursuant to Section 502.7; and

402.5 For all materials subject to Sections 302 and 304.1: Recommendations regarding thinning, reducing, or mixing with any material.

**403**     **CALCULATION FOR DETERMINING VOC COMPOSITE PARTIAL PRESSURE:**  
VOC composite partial pressure shall be calculated by the following equation:

$$PP_c = \frac{\sum_{i=1}^n \frac{(W_i)(VP_i)}{MW_i}}{\frac{W_w}{MW_w} + \sum_{e=1}^n \frac{W_e}{MW_e} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where:

<u>PP<sub>c</sub></u>	≡	<u>VOC composite partial pressure at 20 °C, in mm Hg.</u>
<u>W<sub>i</sub></u>	≡	<u>Weight of the "i"th VOC compound, in grams, as determined by ASTM E 260-96.</u>
<u>W<sub>w</sub></u>	≡	<u>Weight of water, in grams as determined by ASTM D 3792-99.</u>
<u>W<sub>e</sub></u>	≡	<u>Weight of the "e"th exempt compound, in grams, as determined by ASTM E 260-96.</u>
<u>MW<sub>i</sub></u>	≡	<u>Molecular weight of the "i"th VOC compound, in grams per g-mole, as given in chemical reference literature.</u>
<u>MW<sub>w</sub></u>	≡	<u>Molecular weight of water, 18 grams per g-mole.</u>
<u>MW<sub>e</sub></u>	≡	<u>Molecular weight of the "e"th exempt compound, in grams per g-mole, as given in chemical reference literature.</u>
<u>VP<sub>i</sub></u>	≡	<u>Vapor pressure of the "i"th VOC compound at 20°C, in mm Hg, as determined by Section 502.7 of this rule.</u>

**404**     **CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL EXCLUDING WATER AND EXEMPT COMPOUNDS:** For the VOC content as applied, the volume of material is defined as the volume of the original material plus any material (e.g., thinners, reducers, or catalysts) added to the original material. For the VOC content as supplied, the volume of material is defined as the volume of the original material. The weight of VOC per combined volume of VOC and material solids shall be calculated by the following equation:

$$G_1 = \frac{W_v - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where:

<u>G<sub>1</sub></u>	≡	<u>Weight of VOC per volume of material, less water and exempt compounds, in grams per liter</u>
<u>W<sub>v</sub></u>	≡	<u>Weight of all volatile compounds, including any volatile materials added to the original material supplied by the manufacturer when calculating the VOC content as applied, in grams</u>
<u>W<sub>w</sub></u>	≡	<u>Weight of water, in grams</u>
<u>W<sub>ec</sub></u>	≡	<u>Weight of exempt compounds, in grams</u>
<u>V<sub>m</sub></u>	≡	<u>Volume of material, in liters</u>
<u>V<sub>w</sub></u>	≡	<u>Volume of water, in liters</u>
<u>V<sub>ec</sub></u>	≡	<u>Volume of exempt compounds, in liters</u>

**405**     **CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL INCLUDING WATER AND EXEMPT COMPOUNDS:** For the VOC content as applied, the volume of material is defined as the volume of the original material, plus any material added to the original material (e.g., thinners or reducers). For the VOC content as supplied, the

volume of material is defined as the volume of the original material. The weight of VOC per total volume of material shall be calculated by the following equation:

$$G_2 = \frac{W_v - W_w - W_{ec}}{V_m}$$

Where:

$G_2$  = Weight of VOC per total volume of material, in grams per liter  
 $W_v$  = Weight of all volatile compounds, in grams  
 $W_w$  = Weight of water, in grams  
 $W_{ec}$  = Weight of exempt compounds, in grams  
 $V_m$  = Volume of material, in liters

**406 CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE:** The VOC mass emission rate shall be calculated both upstream and downstream of the emissions control device based on the VOC mass concentration and volumetric flowrate, pursuant to Section 502.5 and the following equations:

406.1 VOC Mass Emission Rate:

$$M = (Q) * (C) * (60 \frac{\text{min}}{\text{hr}}) \text{ (calculated upstream and downstream)}$$

Where:

$M$  = VOC mass emission rate (upstream and downstream, in lb/hr.  
 $Q$  = the volumetric flowrate at the inlet (upstream) or exhaust stack outlet (downstream), in standard cubic feet per minute as determined by Section 502.4.  
 $C$  = the VOC mass concentration at the inlet (upstream) or outlet (downstream), in pounds per standard cubic feet, as determined pursuant to Section 502.4.

406.2 The percent control efficiency is calculated as follows:

$$\%CE = \left( \frac{M_u - M_d}{M_u} \right) * 100$$

Where:

$CE$  = control efficiency.  
 $M_u$  = the upstream VOC mass emission rate, in lb/hr.  
 $M_d$  = the downstream VOC mass emission rate, in lb/hr.

**407 CALCULATION FOR DETERMINING VOC EMISSIONS FOR STATIONARY SOURCES INCLUDING THOSE EXEMPT PURSUANT TO SECTIONS 104.1 AND 104.2.**

407.1 The total VOC emissions from materials shall be determined as follows:

$$E = \sum (E_1 + E_2)$$

407.2 VOC Emissions from Ink Usage:

$$E_1 = U_1 * P_1 * (1 - R)$$

Where:

- E<sub>1</sub> = VOC emissions from ink usage (lbs-VOCs/month)  
U<sub>1</sub> = ink usage as applied (gallons/month). This equals the ink usage in pounds per month divided by the density of the ink.  
P<sub>1</sub> = VOC content (lbs-VOC/gallon), applied as, determined pursuant to Section 502.1  
R = ink retention factor (20% for heat-set lithographic printing, 95% for non-heat set lithographic printing, and 0% for all other printing operations)

407.3 VOC Emissions from Materials (Except Inks) Usages:

$$E_2 = \sum_{i=1}^n (U_i) * (V_i)$$

Where:

- E<sub>2</sub> = VOC emissions from materials (except inks) used (lbs-VOCs/month)  
U<sub>i</sub> = material usage, as applied, (gallons/month)  
V<sub>i</sub> = VOC content in the material (lbs-VOC/gal), as applied, as determined pursuant to Section 502.1

## 500 MONITORING AND RECORDS

**501 ~~USAGE RECORDS~~ RECORD KEEPING** ~~Any person subject to this rule, including owners or operators of facilities claiming exemption under Sections 102.1, and 102.2, shall comply with the following requirements:~~

~~501.1 The person shall maintain a current list of inks, coatings, adhesives, fountain solutions, makeup solvents (reducers, thinners), and surface preparation and cleanup solvents which states the VOC content of each, on an as-applied (press-ready) basis. The VOC content of inks, coatings, and adhesives shall be given pursuant to Section 302.1. The VOC content of fountain solutions and makeup solvents, shall be given pursuant to Section 303.1. The VOC content of surface preparation and cleanup solvents shall be given pursuant to Section 305.1.~~

~~501.2 For persons using graphic arts materials which comply with the VOC limits specified in Section 302, 303 and 305, records shall be maintained on a monthly basis, showing the type and volume of inks, coatings, adhesives, fountain solutions, and makeup solvents used, and solvents or other materials used for surface preparation, cleanup, or ink, coating, or adhesive removal.~~

~~501.3 For persons using graphic arts materials exceeding the VOC limits specified in Sections 302 and 303 and 305, and using a control system pursuant to Section~~

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~~304, daily records shall be maintained of the type and volume of graphic arts materials used.~~

~~501.4 Operation and maintenance records as required by the Operation and Maintenance Plan in Section 401, shall be maintained by the source on a daily basis.~~

~~501.5 Records specified in Section 501 shall be retained on-site for two years and made available for review by the Air Pollution Control Officer upon request.~~

In addition to any existing permit conditions issued pursuant to Rule 501, GENERAL PERMIT REQUIREMENTS, any person subject to this rule, including operations claiming exemption under Section 104.1 and 104.2, shall comply with the following requirements:

501.1 **LIST OF MATERIALS:** A list shall be maintained of all materials currently used and/or stored at the site. The list shall include the following information:

- 501.1.1 Material type (e.g., adhesive, coating, ink, fountain solution, extreme performance ink/coating, or cleanup solvent) by name/code/manufacture and the appropriate material type category as designated in Sections 302 and 304.1 as applicable.
- 501.1.2 The actual VOC content of the materials (e.g., adhesive, coating, or ink) listed in Section 302.1, as applied excluding water and exempt compounds.
- 501.1.3 The actual VOC content of the fountain solution listed in Section 302.2 as applied, including water and exempt compounds in grams per liter or pounds per gallon. The VOC content as provided by the manufacturer may be acceptable if the fountain solution is used as supplied.
- 501.1.4 The actual VOC content of the cleaning materials listed in Section 304, as applied including water and exempt compounds in grams per liter or pounds per gallon.
- 501.1.5 The VOC composite partial pressure for materials listed in Section 304.1, if applicable. The composite partial pressure shall be calculated pursuant to Sections 403 and 502.7.
- 501.1.6 The actual mixing ratio used for the material, as applied.
- 501.1.7 For inks, the density of the ink in lbs/gallon.
- 501.1.8 For aerosol adhesives exempt pursuant to Section 104.7, records of VOC content in the aerosol adhesive. The VOC content shall be recorded as percent by weight. The record shall also include the type of operation (i.e., substrate, purpose) for which the aerosol adhesive is used.
- 501.1.9 For screen printing, the substrate to which the material is applied.
- 501.1.10 For extreme performance ink/coating indicate what the material is intended to resist or withstand and what substrate it is intended to be applied to.
- 501.1.11 Identification of each material type exceeding the VOC limits specified in Sections 302 and 304.1 or the composite vapor pressure specified in Section 304.1.

501.2 **PRODUCT INFORMATION:** The information listed under Sections 402.1 through 402.5 shall be maintained on-site and made available to the Air Pollution Control Officer upon request.

501.3 **Usage Records:** Any person within the District using materials regulated by this rule shall update and maintain the records as required by this rule as follows:

501.3.1 **Daily:**

501.3.1.1 For noncompliant materials: Records regarding the use, including the lack of use, of each material type by name/code/ and the total applied volume in gallons or weight in pounds (weight allowed for ink only) of each material

501.3.2 **Monthly:**

501.3.2.1 Records of total applied volume in gallons or weight in pounds (weight allowed for ink only) for each material (including thinners, reducers, hardeners, retarders, catalysts, fountain solutions and cleaning materials), specified by material type as listed in Sections 302 and 304.1.

501.3.2.2 For graphic arts operations exempt pursuant to Sections 104.1, 104.2, or 104.8, records of total VOC emissions from all materials (including thinners, reducers, hardeners, retarders, and catalysts) used for each calendar month in pounds. The records shall be determined using emission calculations specified in Section 407.

501.3.2.3 Records of total applied volume for each material exceeding the VOC limits specified in Sections 302 and 304.1 by name/code/manufacture and material type.

501.3.2.4 Records showing the percentage of Lithographic and Letter Press, Other Cleaning materials (i.e., metering rollers and plates) as calculated pursuant to Section 302.2.

501.3.2.5. Extreme Performance Ink/Coating: Records of applied volume in gallon or by weight in pounds (weight allowed for ink only), what the material is used to resist or withstand, and what substrate it was applied to.

501.4 **Emission Control Equipment:** Any person using emission control equipment pursuant to Section 303 as a means of complying with this rule shall maintain:

501.4.1 On a daily basis:

501.4.1.1. Such records as required by the Operation and Maintenance Plan in Section 401; and

501.4.1.2 Records of applied volume in gallon or by weight in pounds (weight allowed for ink only); and

501.4.1.3 Records of test reports conducted pursuant to Section 502.

501.5 **Duration of Records - Emission Control Equipment:** Such records shall be maintained on-site for five years and made available for review by the Air Pollution Control Officer upon request.

**502 TEST METHODS**

502.1 ~~Analysis of Samples~~ **DETERMINATION OF VOC CONTENT:** ~~Measurement of the volatile~~ VOC content ~~in~~ of the material (except as provided for in Section

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502.2), as applied, shall be ~~made~~ determined in accordance with EPA Method 24, Section 404, and Section 502.3 if less water and exempt compounds or with EPA Method 24 and Section 404 if including water and exempt compounds.

502.2 Analysis of Samples, Non-Heatset Polymerizing Lithographic Or Letterpress Inks: Measurement of the volatile content shall be made in accordance with EPA Method 24. All components of the sample must be weighed in the proper proportion into the analysis container and mixed together, with the mixture then being allowed to stand for at least one hour, but no more than 24 hours, prior to being oven-dried at 110 °C for 1 hour.

502.3 Determination of Exempt Compounds: ~~Compounds Exempt compounds, as listed in Section 206 pursuant to Section 213,~~ shall be determined in accordance with ASTM D4457-~~85~~91 or ARB Method 432. If any of the perfluorocarbons are being claimed as exempt compounds, the person making the claim must state in advance which compounds are present, and the EPA-approved test method used to make the determination of these compounds.

502.4 Determination Of Control ~~Device~~ Efficiency: Control efficiency of the control equipment shall be determined in accordance with applicable EPA Methods 18, 25, 25A, EPA Method 2 or 2C; and Section 406, (1) U.S. EPA Method 18, 25 or 25A, for VOC concentration, and (2) U.S. EPA Method 2 or 2C for flow rates, as applicable, and calculated in accordance with Section 406.

502.45 Determination Of Control ~~Device~~ Equipment Efficiency: Efficiency of the emission control equipment ~~device~~ shall be based upon test measurements made in accordance with:

1.502.5.1 USEPA Method 18, 25 or 25A, for VOC concentration, and

2.502.5.2 USEPSA Method 2 or 2C for flow rates, as applicable, and calculated in accordance with Section ~~204~~ 406.

502.~~56~~ Determination of ~~Capture~~ Collection Efficiency: ~~Efficiency of the capture system~~ Collection efficiency shall be determined in accordance with U.S. EPA technical guideline Document, "Guidelines for Developing Capture Efficiency dated January 9, 1995". Individual capture efficiency test runs subject to U.S. EPA technical guidelines shall be determined by: "Guidelines for Determining Capture Efficiency, January 9, 1995". Individual capture efficiency test runs subject to the U.S. EPA technical guidelines, calculated in accordance with Section 201, shall be determined by:

503~~2.46~~.1 Applicable U.S. EPA methods 204, 204A, 204B, 204C, 2404D, 204E, and/or 204F; or

~~503.4.2~~ The South Coast Air Quality Management District "Protocol for Determination of Volatile Organic Compound (VOC) Capture Efficiency"; or

503~~2.46~~.32 Any other method approved by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.

502.7 DETERMINATION OF VOC COMPOSITE PARTIAL PRESSURE: VOC composite partial pressure shall be determined in accordance with Section 403 and Section 502.8.

502.8 **DETERMINATION OF VAPOR PRESSURE:** Vapor pressure of a VOC shall be determined in accordance with ASTM Method D2879-97, or may be obtained from the most current edition of a published source, including, but not limited to:

502.8.1 *The Vapor Pressure of Pure Substances*, Boublik, Fried, and Hala; Elsevier Scientific Publishing Company, New York.

502.8.2 *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company.

502.8.3 *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company.

502.8.4 *Lange's Handbook of Chemistry*, John Dean, editor, McGraw-Hill Book Company.

Notwithstanding the provisions of this section, the Air Pollution Control Officer may require the use of a vapor pressure determined in accordance with ASTM Method D2879-97 for determining compliance with this rule.

502.9 **DETERMINATION OF METAL CONTENT IN INKS:** The metal content of metallic inks shall be determined in accordance with the South Coast Air Quality Management District's Method 318, "Determination of Weight Percent Elemental Metals in Coatings by X-ray Diffraction". Use of this method for determining the content of metals other than aluminum in metallic inks shall be subject to approval by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.